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FEED REQUIREMENTS IN RAISING WEANED RABBITS TO A WEIGHT OF 6 POUNDS

By Chas. E. Kellogg, biologist, Section of Fur Resources
Division of Wildlife Research

The Bureau of Biological Survey has reported experiments carried on at the United States Rabbit Experiment Station, Fontana, Calif., showing that 5.3 pounds of feed will produce 1 pound of live young rabbits at 60 days of age, at which time the rabbits used in the experiments were weaned. Further experiments at the station have furnished data on the feed required to raise weaned young until they weigh 6 pounds.

The young rabbits used in the later experiments, as in the earlier ones, were New Zealands, mostly white New Zealands. All were weaned at 56 days of age, but in order to have a sufficiently large number of animals for the experiments some as old as 67 days were included. More than 52 percent of the rabbits, however, were only 57 days old, nearly three-fourths of them were not older than 59 days, and the average initial age for the 263 rabbits that completed the experiment was 58.6 days. Only entire litters, both bucks and does, of more than 3 to a litter, were included in the experiment regardless of weight at weaning time. The weights of the rabbits at weaning time varied from 1.5 to 4.5 pounds, the average weight of the 263 being 3.03 pounds. The average weight of the bucks was almost the same as that of the does.

The sexes were kept in separate hutches. The rabbits were weighed every 7 days, and when one attained a weight of 6 pounds, it was weighed on the two following days in order to get an average final weight.

The rabbits, which were continued in every case on the ration on which they had been raised to weaning time, were fed 8 different rations, all of which had a nutritive ratio of 1 to 3.72--that is, 1 part of digestible protein to 3.72 parts of carbohydrates and fats--hay in each ration comprising exactly 60 percent of the total feed. Four of the 8 rations were fed to determine the most desirable protein supplement for rabbit feeding--peanut meal, soybean meal, or linseed-oil meal. The other four rations were to test the relative value of barley, oats, wheat, and corn. All rations included minerals and cod-liver oil as well as a standard basal mixture of concentrates other than those enumerated. Some of the groups of rabbits were given in addition a small quantity of green feed.

Some interesting comparative results were obtained. It was found that the does attained a weight of 6 pounds in exactly 8 weeks, whereas the bucks required about 4 days longer to attain the same weight. The primary factor influencing the time required to attain 6 pounds seemed to be the initial weight of the animal, regardless of age, as in some cases the 57-day-old rabbits weighed more than those 67 days old.

The average quantity of feed per pound of live weight gained required to increase the weight of weaned rabbits to 6 pounds was found to be 2.51 pounds of concentrates, 3.77 pounds of hay, and 0.55 pound of green feed, or a total of 6.83 pounds of feed, containing 3.84 pounds of total digestible nutrients.

Comparison of the groups receiving the various kinds of protein supplements showed that a dampened ration containing soybean meal was the most efficient. With the dampened soybean-meal ration on the basis of 100 percent, the quantities of the other protein supplemental feeds required for each pound of gain would be represented as follows: Peanut meal, 112 percent; soybean meal (ration dry), 113 percent; and linseed-oil meal, 114 percent.

In the groups fed the various kinds of grains, the one receiving corn as the basis required the least feed per pound of gain in live weight. This is to be expected as corn has the least fiber content. With corn, then, as a basis of 100 percent, the quantities of the other feeds required would be represented as follows: Oats 104.6 percent; wheat 104.7 percent; and barley 108.9 percent.

It should be kept clearly in mind that these percentage comparisons deal only with the quantity required to add 1 pound to the weight of the young rabbit, and they do not consider the relative price of the various feeds. For the 9-year period previous to 1933, the average prices the producer received for feed were: Wheat $1.02 a bushel, corn 75 cents a bushel, oats 36 cents a bushel, barley 51 cents a bushel, linseed meal $43.60 a ton, soybean and peanut meal $48.46 a ton (this being an estimate as no average figures were obtainable), and alfalfa hay $12.85 a ton. Based on these averages, though corn was the most efficient of the grains, the cost of producing a 1-pound gain on this feed was higher than that on either oats or barley, while the gains from the wheat ration were the most expensive.

The feed costs per pound of gain in live weight determined in these experiments varied from 6.4 to 7.9 cents, depending on the kind of ration fed. This is materially higher than the feed costs of rabbits previous to weaning, as determined in earlier experiments, but the information is not exactly comparable, since the rabbits used in those experiments were fed on rations slightly different from the ones used in the later experiments. Table 1 at the end of this paper shows the costs at various prices of feeds. As shown in this tabulation the cost of the 6.83 pounds of feed required is about 3 1/2 cents when alfalfa hay costs $5 a ton, green feed $2.50 a ton, and concentrates $1 a hundredweight. If hay costs $20 a ton, green feed $10 a ton, and concentrates $2 a hundredweight, the cost of 6.83 pounds of feed as shown in the table, would be about 9 cents a pound. Between these extremes, total costs shown in the table vary according to the possible costs of the hay and greens and the concentrates.

Costs other than feed for the breeding does and young during the suckling period will be decidedly greater than they will be for the individuals after they are weaned. On this subject, however, there is no available information based on experiments, and such data are urgently needed for determining accurately the total costs of producing rabbits.

A factor that should be considered in connection with the feeding of the older rabbits is the death of individuals after weaning and before they have attained a weight of 6 pounds. In this series of experiments 15 percent of the animals died during this period, and their average weight at death was nearly 4 pounds. Many of these could have been sold for market purposes at weaning time. Young rabbits that are too light at weaning age must necessarily be carried until they attain a marketable weight.

Immediately on completion of this experiment the rabbits were killed and careful weights obtained of the by-products and the various parts of the carcass. It was found that the average dressing percentage of these animals was 54.9, liver and heart included. The green skin comprised 9.2 percent of the total live weight, and the head 7.6 percent. The percentage relations of commercial cuts to total live weights were as follows: Hind legs, 19.4 percent; back, or saddle, 13.4 percent; ribs, or rack, 11.2 percent; front legs, 6.6 percent; liver and heart, 4.3 percent.

When these comparisons were made with the total weight of the carcass it was found that the hind legs comprised 35.4 percent; saddle, 24.4 percent; front legs, 12.0 percent; liver and heart, 7.8 percent, and the rib section, 20.4 percent.

The rib section comprises slightly more than one-fifth of the total weight of the carcass. Would it not be good business practice, in communities where the rabbit carcass is cut into the various parts and marketed in that manner, not to include the ribs with the other cuts? I mean by that, to sell the ribs in separate packages at a decided discount and to add a few cents a pound to the other cuts that contain a higher proportion of meat? The ribs could be used with noodles, or for making pot pies or stews.

It is regretted that the data resulting from these experiments have not been entirely completed. All the skins were carefully marked and were then graded by rabbit-skin dealers and manufacturers. It is hoped to determine what influence kinds of feed, season of year, heredity, rapidity of gains, and age of rabbit have on the quality of rabbit skins taken when the rabbit weighs 6 pounds or is about 4 months old.

This information should be of decided value to rabbit raisers, as the difference in price between the best furriers' rabbit skins and the poorest would be an important factor in determining profit or loss. Millions of dollars worth of rabbit skins are annually utilized in the fur trade. These are to a great extent obtained from abroad. The domestic-rabbit producer in this country should cultivate this market.

The United States Rabbit Experiment Station, Fontana, Calif., is conducted for the benefit of the rabbit raisers of the entire United States, and its staff would be glad to receive suggestions at any time and to answer any questions pertaining to problems that face rabbit breeders. (See note on page 4).

Table 1.--Costs of 6.83 pounds of feed, required to increase by 1 pound the live weight of rabbits between weaning age and age at which they weigh 6 pounds, alfalfa hay comprising 60 percent of the ration

Price of alfalfa hay and green feed, per ton	Feed cost when concentrates, per cwt., cost--				
	$1.00	$1.25	$1.50	$1.75	$2.00
	Cents	Cents	Cents	Cents	Cents
Hay, $ 5; green feed, $ 2.50..	3.52	4.15	4.78	5.41	6.04
Hay, $10; green feed, $ 5.00..	4.54	5.16	5.79	6.42	7.05
Hay, $15; green feed, $ 7.50..	5.55	6.18	6.80	7.43	8.06
Hay, $20; green feed, $10.00..	6.56	7.19	7.82	8.45	9.07

#Note.--Since this series of experiments was conducted, additional experimental work at the United States Rabbit Experiment Station has shown, through the selective self-feeding method (see BS-85, "Self-Feeding System for Market Rabbits."), that rabbits up to weaning age will consume approximately twice as much concentrates as roughages and will make more rapid gains in weight than is indicated in this leaflet. Commercial rabbit-meat producers find it more profitable to market 2-months-old animals without weaning them.--(September 1938).